(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 289 862**
A3

(12) EUROPEAN PATENT APPLICATION

(21) Application number: 88106281.4

(22) Date of filing: 20.04.88

(51) Int. Cl.⁴: A23P 1/08 , A23L 1/325 , A23L 1/315

(30) Priority: 28.04.87 GB 8709993

(43) Date of publication of application:
09.11.88 Bulletin 88/45

(84) Designated Contracting States:
BE DE ES FR GB IT NL

(88) Date of deferred publication of the search report:
19.04.89 Bulletin 89/16

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(54) Food product and method of preparing a food product.

(57) A food product, such as a portion of meat, is provided with a coating of protein, which may be afforded by a coating of a batter, or which may be provided by subjecting the meat portion to an operation in which natural protein of the meat is brought to the surface of the portion. The portion is then subjected to a heating operation in which the protein of the coating is substantially "set" or cooked whilst no significant cooking of the portion of meat takes place, the heating operation taking place in the absence of addition fat, that is, in the absence of fat other than may be included in the portion of meat. The product may then be chilled and packaged, to provide a saleable food product, which may be cooked prior to use.

EP 0 289 862 A3

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 88 10 6281

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
X	JOURNAL OF MICROWAVE POWER, vol. 18, no. 4, 1983, pages 345-353, IMPI, Ottawa, CN; L. LOPEZ-GAVITO et al.: "Effects of microwave cooking on textural characteristics of battered and breaded fish products" * Pages 346-347 *	1,2,5,6 ,8,11, 14	A 23 P 1/08 A 23 L 1/325 A 23 L 1/315
X	DE-A-2 610 543 (GENERAL FOODS) * Claims 1,6,7,8,9; example 1 *	1,6,12, 14	
Y	US-A-4 330 566 (R. MEYER) * Claims 1-7; column 1, lines 47-68; column 3, lines 1-52 *	4	
X	EP-A-0 181 024 (HESTER INDUSTRIES) * Claims 12-15; examples 1-6 *	1-6,11, 14	
X	CA-A- 932 202 (R. BOWEN) * Claims 1,4,5,6; page 3, lines 15-23 *	1,2,5,6 ,14	
X	FR-A-2 248 793 (UNILEVER) * Claim 1; example 2; page 4, lines 6-7 *	1,2,5, 14	TECHNICAL FIELDS SEARCHED (Int. Cl.4) A 23 P A 23 L
A	US-A-3 843 827 (C. LEE) * Claims 1,2; examples I,II *	1,12	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	02-02-1989	DESMEDT G.R.A.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
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EPO FORM 1503 03.82 (P0401)

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(11) Publication number: 0 289 862 A2

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(22) Date of filing: 20.04.88

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Food product and method of preparing a food product

This invention is concerned with food products, particularly a saleable article of food comprising meat.

The term "meat" is used herein generically as including animal meat, fish meat, poultry meat and synthetic meat such as soya products.

A typical saleable meat product comprises a portion of meat comprising an outer layer of at least partially cooked protein. For example, a chicken breast consisting of a portion of muscle meat or compressed minced meat may be dipped in a "batter" prior to being coated (e.g. with breadcrumbs), the batter conveniently comprising egg and/or a flour/water mix. The chicken breast is flash fried, conventionally by immersing in fat heated to a temperature of about 190°c, for a period of about 30 seconds to "set" the batter thus holding the breadcrumbs in place. The coated chicken portion may then be chilled and packed to provide a saleable meat product.

Also for example, a "fish finger", consisting of a portion of fish, or a fish/potato mix, may be dipped in a batter comprising a flour or other starch/water mix or milk powder/flour/water mix prior to being coated with crumbs. The fish finger is similarly flash fried to set the batter and hold the crumbs in place.

The use of flash frying involves the use of expensive equipment, and in addition results in a saleable meat product comprising a high fat content.

According to this invention there is provided a method of preparing a food product comprising steps:

(a) providing a portion of meat with a coating which comprises edible adhesive;

(b) subjecting the portion to a heating operation in which the adhesive is substantially "set" or cooked, the heating operation taking place in the absence of additional fat (i.e. in the absence of fat other than may be included in the portion of meat).

The coating may be provided by a gum such as gellatine, agar-agar or guar, or may be provided by a protein or a protein-containing material. Thus the coating may be afforded by a batter, such as a mixture of flour and water, and optionally milk and/or egg, or may be provided by subjecting the portion of meat to an operation in which natural protein (such as myacin) of the meat is brought to the surface of the portion. Such an operation may be a tumbling operation, in which the portions of meat are subjected to tumbling, conveniently being carried out in the presence of brine.

If desired, the portion of meat may be subjected both to a tumbling operation, and being provided with an additional coating comprising protein, such as batter.

If desired additional coating materials, which may include breadcrumbs, cereal, cheese, flavours, herbs and spices may be applied to the coated portion, and caused to adhere to the coated portion by virtue of the inherent sticky nature of the coating.

The heating operation preferably involves subjecting the coated portion to a dry air temperature of at least 60° C, preferably in the range 120°c to 250° c, and to a humidity in the range 55% to 98%. Particularly where the meat portion is provided with a batter, and especially where such additional coating materials are utilised, the heating operation may be such as to cook the portion completely, to provide a saleable article cooked entirely in the absence of additional fat.

Preferably however the heating operation is such as to cook or "set" primarily only the coating, whilst no significant cooking of the portion of the meat takes place, that is desirable to a depth of no greater than 3 mm.

Where the portion of meat is coated with a batter, and/or is provided with additional coating materials of aforesaid, desirably the portion of meat is cooked to a depth only of between 0 mm and 1 mm. Conversely where the portion of meat is subjected to a tumbling operation, and no separatedly applied coating is utilised, the portion is cooked only to a depth of 1 mm and 3 mm. If desired the heating operation may be carried out in two states, the first stage being at a relatively low temperature and relatively high humidity, such as at a temperature of between 120°c and 200°c (preferably 165°c) at a humidity of between 75% and 95% (preferably 85%) and the second stage being at a relatively high temperature and relatively low humidity, such as between a temperature of 190°c and 250°c (preferably 220°c) and a humidity of between 55% and 75% (preferably 65%). In this manner, during the first stage, the heating is carried out in an atmosphere with high moisture content, reducing loss of moisture from the product, whilst the second stage, carried out after the protein has "set" to an acceptable degree, removes surface moisture from the product.

Alternatively or in addition the heating operation may include subjecting the portion to microwave radiation.

Where the heating operation is such that no significant cooking of the portion of meat takes place, desirably the method involves, subsequent to the heating operation, chilling and packing the product to provide a saleable food product.

According to this invention there is also provided a method of preparing a food product involving subjecting the product to a partial cooking operation involving the use of air at a dry temperature of at least 60° C, preferably between 120°c and 250°c, more preferably 165°c to 220°c, and a humidity of between 55% and 98%, preferably between 75% and 90%, and in the absence of additional fat.

The method may be used in the production of a portion of meat coated with an edible adhesive, such as a batter, with primarily the coating alone being cooked, or may be used in the production of a portion of meat previously subjected to an operation by which natural protein of the meat is brought to the surface of the portion, such as by a tumbling operation. Such meat may be used as discrete portions, or the meat may be comminuted and compressed into a desired shape to provide an item of foodstuff such as a burger or fish finger, the cooking operation denaturing (coagulating) the comminuted meat to "seal" the portion of meat and to hold the meat together. Preferably the partial cooking operation is such as to cook the product to a depth of no more than 3 mm, preferably between 0.5 mm and 2 mm.

According to this invention there is also provided a saleable food product, a surface portion only of which is cooked in the absence of a liquid medium specifically water and additional fat.

The surface portion may be of a meat portion of the product, or of a coating provided on the meat portion such as of an edible adhesive, e.g., a batter.

The batter desirably comprises protein, and may comprise egg (such a reconstituted dried egg), flour or other starch, or a mixture thereof.

Preferably the cooking operation is carried out at a temperature of at least 60°C preferably between 120°c and 250°c and at a water humidity of 55% and 98%.

The invention will now illustrated by way of example with reference to three examples which have been selected for the purposes of illustrating the invention.

These examples illustrate the use of an inventive technique, in which a portion of meat is provided with an adhesive layer (i.e. an edible glue) by which an outer coating is held in place, the portion being subjected to a heat process which "sets up" the adhesive layer. The heating processes takes place without the emersion of the product in frying oil, fat, water or any other liquid medium and in the total absence of additional fat. This results in a product with a much lower fat content, with clear health advantages.

EXAMPLE 1

In the preparation of a burger, a quantity of comminuted animal meat is compressed in a forming machine into the shape of a disc at a sufficient pressure and at a sufficiently low temperature to retain the meat particles together. If desired, the adherence of the meat particles may be improved by tumbling the meat portions. The portion is dusted with a flour which may contain seasoning, and is then coated with a batter comprising reconstituted dried egg and flour. The coated portion is then covered with breadcrumbs.

The article is then subjected to a heat treating or partial cooking operation for between 1 and 1½ minutes at a temperature of about 200°c and at a water humidity of between 85% and 90% . This cooks the breadcrumbs and the layer of batter to at least partially seal the meat, and to reduce tendency for the portion of meat to break up. On inspection it would seem that no significant cooking of the meat took place. The item was chilled and packed.

EXAMPLE 2

A method similar to that described in Example 1 was used in the preparation of a fish finger, a portion of flaked fished meat being similarly compressed, and dusted with flour prior to being coated with a batter comprising flour and water (and optionally milk) prior to being covered with breadcrumbs, and subjected to a partial cooking operation as described in Example 1.

EXAMPLE 3

In the preparation of a non-coated meat portion, one or more pieces of muscle meat (e.g. turkey breast) are tumbled in the presence of brine and are treated with seasoning and flavouring and then reduced in temperature prior to being compressed to a desired shape. The portion is then subjected directly to a partial cooking operation as described in Example 1. On inspection it was seen that the meat had been cooked to a depth of between 1 and 2 mm. This tended to make the meat portion stiffer, a reduced tendency for the portion to break up, and in addition provided a seal covering substantially the whole of the surface of the portion.

EXAMPLE 4

A chicken wing is cut into two joints, and is tumbled in brine to bring the myacin protein of the meat to the surface. The tumbled joints are coated with a flour and breadcrumb mix, the mix adhering to the surface of the joints by virtue of the inherent sticky nature of the protein on the surface of the joints, and the joints are subjected to a two stage heating operation. Stage 1, which is carried out for about two minutes, is carried out at a temperature of 165°c and a humidity of 85%, and the second stage, which is carried out for about one minute, involves a temperature of 220°c and a humidity of less than 65%.

Claims

1. A method of preparing a food product comprising the steps:

(a) providing a portion of meat with a coating which comprises edible adhesive;

(b) subjecting the portion to a heating operation in which the adhesive is substantially "set" or cooked, the heating operation taking place in the absence of additional fat.

2. A method according to Claim 1 wherein the coating is afforded by a batter.

3. A method according to one of Claims 1 and 2 wherein the coating is provided by subjecting the portion of meat to an operation in which natural protein (e.g. myacin) of the meat is brought to the surface of the portion.

4. A method according to Claim 1 wherein the coating comprises an edible gum.

5. A method according to any one of the preceding claims in which additional material (which may include one or more of breadcrumbs, cereal and cheese) are applied to the coated portion, and adhered to the coated portion by virtue of the inherent sticky nature of the coating.

6. A method according to any one of the preceding claims wherein the heating operation involves subjecting the portion to a temperature of between 120°c and 250° c, preferably between 165°c and 220°c.

7. A method according to any one of the preceding claims wherein the humidity is between 55% and 98%, preferably between 75% and 90%.

8. A method according to any one of the preceding claims wherein the heating operation is carried out for a period of less than three minutes, preferably less than two minutes, in the absence of water in liquid form.

9. A method according to any one of the preceding claims wherein the portion of meat is cooked to a depth only of between 0 mm and 3 mm.

10. A method according to any one of the preceding claims wherein the heating operation is carried out in two stages, the first stage being at a relatively low temperature at relatively high humidity, the second stage being at a higher temperature and a lower humidity.

11. A method according to any one of the preceding claims wherein the heating operation includes subjecting the portion to microwave radiation.

12. A method of preparing a food product involving subjecting the product to a partial cooking operation involving the use of air at a dry temperature of between 120°c and 250°c, preferably 165°c to 220°c, and a humidity of between 55% and 98%, preferably between 75% and 90%, in the absence of additional fat.

13. A method according to Claim 12 wherein the food product comprises a portion of meat, and the partial cooking operation is sufficient to cook the portion of meat to a depth between 0 mm and 3 mm, preferably between 0.5 mm and 2 mm.

14. A saleable food product, a surface portion only of which is cooked in the absence of a liquid phase.

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